AMENDMENTS TO THE SPECIFICATION:

Please replace paragraphs starting at line 1 on page 8 to line 6 on page 9 with the following:

Figure 1 is a system block diagram illustrating a decoding algorithm 100 according to one embodiment of the present invention. The decoding algorithm 100 was found by the present inventors to provide reduced complexity without much loss in performance when compared with known sub-optimal schemes based on iterative interference cancellation. In order to preserve clarity and brevity, and to better understand how decoding algorithm 100 functions, it will be assumed that each random entry in **v** is complex Gaussian with variance σ^2 and that the expected value of the transmit power on each antenna is constrained to be 1. A received symbol vector $\mathbf{y}_k$ is multiplied by the conjugate transpose of the channel matrix yielding

$$\mathbf{z}_k = \mathbf{H}^*\mathbf{H}\mathbf{s}_k + \mathbf{H}^*\mathbf{v}. \tag{3}$$

The entries in the column vector $\mathbf{z}_k$ are then reordered based on the column norms 110 of the channel. This is done by defining

$$\widetilde{\mathbf{z}}_k = \left[z_{k,i_1}, z_{k,i_2}, \ldots, z_{k,i_{M_t}}\right]^T, \quad \widetilde{\mathbf{s}}_k = \left[s_{k,i_1}, s_{k,i_2}, \ldots, s_{k,i_{M_t}}\right]^T \tag{4}$$

and

$$\widetilde{\mathbf{v}}_k = \left[v_{k,i_1}, v_{k,i_2}, \ldots, v_{k,i_{M_t}}\right]^T, \text{ and } \widetilde{\mathbf{H}} = \left[\mathbf{H}_{k,i_1}, \mathbf{H}_{k,i_2}, \ldots, \mathbf{H}_{k,i_{M_t}}\right] \tag{5}$$

where for $m \le n$, $\left\|\mathbf{H}_{k,k_m}\right\|_2 \le \left\|\mathbf{H}_{k,i_n}\right\|_2$. At this point, a Cholesky decomposition 120 is taken such that

$$\mathbf{L}^*\mathbf{L} = \widetilde{\mathbf{H}}^*\widetilde{\mathbf{H}} + \sigma^2\mathbf{I}_{M_t}. \tag{6}$$

Now multiplying $\tilde{\mathbf{z}}_k$ by $\mathbf{L}^{*-1}$ yields

$$\mathbf{x}_k = \mathbf{L}^{*-1}\left(\tilde{\mathbf{H}}^*\tilde{\mathbf{H}} + \sigma^2\mathbf{I}_{M_t}\right)\tilde{s}_k - \mathbf{L}^{*-1}\sigma^2\mathbf{I}_{M_t}\tilde{\mathbf{s}}_k + \mathbf{L}^{*-1}\tilde{H}^*\tilde{\mathbf{v}} = \mathbf{L}\tilde{\mathbf{s}}_k + \mathbf{L}^{*-1}\left(\tilde{\mathbf{H}}^*\tilde{\mathbf{v}} - \sigma^2\mathbf{I}_{M_t}\tilde{\mathbf{s}}_k\right) \quad (7)$$

where $\tilde{\mathbf{s}}_k$ is the true sorted symbol vector. The triangular matrix **L** is then used to solve backwards for $\tilde{\mathbf{s}}_k$. After estimating $\tilde{\mathbf{s}}_k$, the vector is then sorted into an estimate of the transmitted symbol vector $\hat{\mathbf{s}}_k$. The decoding algorithm 100 returns this estimated vector along with the soft and hard decoded bits from Solve Backwards and Sort 130 as shown in Figure 1.

Please replace the abstract with the following:

A channel norm-based ordering and whitened decoding technique (lower complexity iterative decoder) for MIMO communication systems performs approximately the same level of performance as an iterative minimum mean squared error decoder. Decoding a signal vector comprises receiving a signal vector $\mathbf{y}_k$, multiplying the received signal vector $\mathbf{y}_k$ by a conjugate transpose of a channel matrix $\mathbf{H}^*$. A column vector $\mathbf{z}_k$ is generated. The entries of the column vector $\mathbf{z}_k$ are reordered and an estimated channel matrix $\tilde{\mathbf{H}}$ is generated. The estimated channel matrix $\tilde{\mathbf{H}}$ decomposed using a Cholesky decomposition and generating a triangular matrix **L**. Triangular matrix **L** is solved backwards and a signal vector $\tilde{\mathbf{s}}_k$ estimated. An estimate of the transmitted symbol vector $\hat{\mathbf{S}}_k$ is generated.